in which the facts of the case were clearly set forth, were printed in the last volume of NATURE, which also contains several articles bearing upon the question then at issue (vol. lviii. pp. 54, 155, 176, 294). It is satisfactory to know that the Government has been guided by the unmistakable expression of opinion which their proposal elicited, and has arranged for the erection of the new science buildings on the land obtained for that purpose on the west side of Exhibition Road. By the kindness of Mr. Aston Webb, we are able to give a copy of his first sketch of the building which it is proposed to erect facing the Imperial Institute in Imperial Institute Road. It will be seen that the building will provide science with a worthy home, in which instruction and investigation can be carried on under good conditions. We hope in a future issue to give detailed plans of the chemical and physical laboratories. The position of the astro-physical laboratory has not yet been decided, but particulars will be given as soon as they are available.

NOTES.

IT has been decided to give the name "Victoria and Albert Museum" to the new building at South Kensington, the foundation stone of which will be laid by the Queen on May 17.

THE Council of the Institution of Civil Engineers have made the following awards for papers read and discussed before the Institution during the past Session:—A George Stephenson Medal and Premium to Mr. R. A. Hadfield; a Telford Medal and Premium to Mr. J. T. Milton; Watt Medals and Premiums to Sir Albert J. Durston, K.C.B., and Mr. H. J. Oram; a Crampton Prize to Mr. Francis Fox; a Manby Premium to Sir William Roberts-Austen, K.C.B.; Telford Premiums to Messrs. J. M. Dobson, W. G. Kirkaldy, and A. P. Head. The presentation of these awards, together with those for papers which have not been subject to discussion, and will be announced later, will take place at the inaugural meeting of next Session.

THE American National Academy of Sciences has awarded the fifth Watson medal to Dr. David Gill, F.R.S., Astronomer Royal at the Cape.

THE Council of the Royal College of Surgeons of England have resolved that the centenary of the foundation of the College shall be celebrated on a suitable date between March 22 and June 30, 1900.

WE regret to see the announcement of the death, at Paris, of the distinguished chemist, Prof. M. Charles Friedel, member of the Paris Academy of Sciences.

MR. ROLLO APPLEYARD, the official reporter of the Physical Society of London, has had to resign his office owing to the pressure of other work.

THE Sydney correspondent of the *Times* states that to-morrow (April 28) Sir Frederick Darley, the Lieutenant-Governor, will dedicate for public use the site of Captain Cook's landing on Kurnell Beach, in Botany Bay, on April 28, 1770.

AN excursion to Brittany has been arranged by the Geologists' Association for the Whitsuntide holidays, May 17–24, the directors being Dr. Charles Barrois and M. P. Lebesconte. The places to be visited by the members include several of special geological interest.

THE autumn Congress of the Sanitary Institute will be opened at Southampton on August 29. The preliminary circular announces that the president of Section I. (Sanitary Science and Preventive Medicine) will be Sir Joseph Ewart; of Section II. (Engineering and Architecture), Mr. James Lemon; and of Section III. (Physics, Chemistry, and Biology), Prof. Percy J. Frankland, F.R.S.

IT is announced that the Committee to which was entrusted the duty of deciding upon a suitable memorial to be erected by the citizens of Philadelphia, in honour of the late Dr. Pepper, in recognition of his many services to the community, has recommended the erection, at a cost of 10,000 dollars (2000*l.*), of a statue, which it is proposed shall be placed upon the Plaza of City Hall.

THE Danish Meteorological Institute has issued a Circular proposing that all the Meteorological Institutes of Europe and America shall subscribe to the cost of daily telegraphic weather reports from Iceland and the Faroes. The Great Northern Telegraph Company has undertaken, as soon as fourteen Institutes have notified their adhesion to the proposal, to lay a telegraph cable to the Islands. The cost of the daily reports is to be partly determined by the size of the various countries subscribing for them.

UNDER the direction of the Government of Belgium, Prof. G. Gilson, Louvain University, is about to commence a series of experiments on the currents of the North Sea. On Saturday, April 29, the first set of bottles will be set off from the West Hindar light vessel, 2° 26′ E. longitude, 51° 23′ N. latitude—*i.e.* about twenty miles north-west of Ostend. Each bottle contains a printed card, and it is hoped that any one who picks up one of these bottles will take out the card and fill up the blanks reserved for the place and date of finding, name and place if found on the shore, latitude and longitude if on the sea, or bearings, if any. Finders are not required to pay postage.

THE *Morning Post* states that a Committee of the St. Petersburg Astronomical Society, appointed to examine the question of the reform of the Russian Calendar, having applied to all the Government Departments for their opinions on the question, the Ministries of Communications, the Interior, Finance, and Foreign Affairs have replied in favour of the adoption of the proposed reform at an early date. The Committee will proceed with its labours immediately, and will probably have concluded them by the beginning of June.

A PRIZE, founded by Baron Léon de Lenval of Nice, will be awarded at the International Otological Congress to be held in London from August 8 to 11. The prize is a sum of 3000 francs, bearing the name of "The Lenval Prize," and it will be awarded to the author of the most marked advances in the practical treatment of affections of hearing since the last Congress, or to the inventor of any new apparatus which is readily portable and improves considerably the hearing-power of deaf persons. All persons desirous of competing for the prize are requested to communicate with Mr. Cresswell Baber, honorary secretary general, 46 Brunswick Square, Brighton, stating the facts on which their claim is based.

WE learn from the *Lancet* that a Congress, having for its subject the prevention of tuberculosis, will be held in Berlin, under the patronage of H.I.M. the Empress of Germany, from May 24 to May 27. The president is the Imperial Chancellor, Count Hohenlohe-Schillingsfürst, and the vice-president is Dr. von Leyden. The objects of the conference are to make the dangers of tuberculosis as a disease known among people in general, and the best means for combating the disease. Besides these subjects will be discussed the present range of knowledge concerning tuberculosis and the various methods of prevention, more especially the treatment of sanatoria.

A WARD of the Royal Southern Hospital, Liverpool, to be used in connection with the new school for the treatment of tropical diseases, was opened by Lord Lister on Saturday. The *Lancet* states that Major Ronald Ross, who has just been elected to the post of lecturer in tropical medicine in the school, has had eighteen years' training in his subject, while his discoveries in relation to the malarial parasite have placed him amongst the foremost investigators. In January last Dr. Laveran communicated Major Ross's researches to the French Academy of Medicine, the Italian observers have confirmed his observations, and more recently Prof. Koch has shown their importance and accuracy. In no place in this country will such work be more generally appreciated than in Liverpool.

PROF. HEINRICH KIEPERT, the distinguished geographer, died at Berlin on Friday last, at the age of eighty-one. His geographical work consisted largely in the construction of maps illustrative of ancient history, and more especially of South-Eastern Europe and Western Asia. Prof. Kiepert was born at Berlin, and studied at the University of that city. After having charge for a few years of the Geographical Institute in Weimar, Kiepert returned to Berlin, and in 1859 was appointed Extraordinary Professor, and in 1874 Ordinary Professor, of Geography in the University. His activity in the production of maps and atlases, together with memoirs to accompany these, continued almost unabated to the end.

THE death is announced, at eighty-two years of age, of Mr. Jabez Hogg, distinguished as an ophthalmic surgeon, microscopist, and writer of scientific works. He was vice-president of the Medical Society in 1851–52, was elected a Fellow of the Linnean Society in 1866, and honorary secretary to the Royal Microscopical Society from 1867 to 1872. He was the first president of the Medical Microscopical Society. Mr. Hogg was a prolific writer, and was the author of works on photography, domestic medicine, English forests and forest trees, experimental and natural philosophy; history, construction, and applications of the microscope; colour blindness, microscopic examination of water, and numerous papers on disease of the eye, contributed to the medical journals.

MR. JOSEPH WOLF, an artist whose pictures of animals have delighted many naturalists, died on Thursday last, at the age of seventy-nine. Referring to his career, the *Times* states that he was early apprenticed to a lithographer, studied in Antwerp, and came by invitation to London to take up the work of illustration for Gray's "Genera of Birds," a standard work then in progress. This led to work for the *Proceedings* of the Zoological and Linnean Societies. Among other books for which he made drawings were "The Birds of North-East Africa," "The Birds of Japan," and Gould's "Birds of Great Britain"; while he also helped to illustrate Livingstone's "Missionary Travels," Wallace's "Malay Archipelago," and Baldwin's "African Hunting." His studio was once a resort of explorers, artists, and scientific men; among his friends and admirers were Darwin, Owen, Oswell, and the Duke of Argyll. It is, however, chiefly by the books he has enriched with inimitable illustrations that he is best known. In the seventies his "Life and Habits of Wild Animals" was in the hands of every naturalist.

REUTER'S Agency is informed that the following are Dr. Sven Hedin's plans for his new expedition in Central Asia:—Dr. Sven Hedin will start from Stockholm at the end of June, and will travel direct through Russia and Turkestan to Kashgar, taking a new route over the mountains. On reaching Kashgar he will proceed in an easterly direction for the purpose of making fresh investigations in Chinese Turkestan, where he hopes to find further antiquities. Thence he will visit the Lop-nor region, and will cross the great Sand Desert by more than one route. After going to Tibet and exploring that portion of the country to the south of his former route, he will return *via* India. As in the case of his famous journey across Asia, Dr. Sven Hedin's objects on this expedition are purely scientific. Dr. Hedin is, however, better prepared than he was on that occasion, and hopes to achieve even better results than he did then. The expenses of the expedition, which will amount to 2000*l.*, have been defrayed by King Oscar, Mr. Emanuel Nobel, and others.

THE first annual report of the Secretary of the Washington Academy of Sciences has been issued. For several years efforts have been made to federate the various scientific societies in Washington, and a committee appointed with this end in view formulated a plan of co-operation in 1882, which was adopted by the Anthropological and Biological Societies, but was rejected by the Philosophical, and thus failed to be realised. Six years later a movement to secure a permanent committee to deal with questions of common interest was more successful, and a Joint Commission, upon which the several scientific societies were represented, was created. Out of this Commission, which was primarily organised for business purposes, the Washington Academy has grown. The Academy was incorporated a year ago, with Prof. J. R. Eastman as president, Prof. G. K. Gilbert as secretary, and Mr. B. R. Green as treasurer. The vice-presidents, elected on the nomination of the several scientific societies, are: for the Anthropological Society, Prof. J. W. Powell; Biological, Dr. L. O. Howard; Chemical, Mr. H. N. Stokes; Entomological, Mr. W. H. Ashmead; Geographic, Mr. A. Graham Bell; Geological, Mr. C. D. Walcott; and Philosophical, Prof. F. H. Bigelow. In addition to the seven societies here mentioned, the affiliated societies are the Columbia Historical Society, and the Medical Society.

ON Tuesday next, May 2, Prof. Silvanus P. Thompson, F.R.S., will deliver the first of a course of two lectures at the Royal Institution on electric eddy currents. These are the Tyndall lectures. The Friday evening discourse on May 5 will be delivered by Dr. W. J. Russell, F.R.S.; his subject is "Pictures produced on photographic plates in the dark."

THE expenses connected with the preparation and publication of the second volume of the "Recueil des données numériques," just issued by the French Physical Society, have been paid by a friend of science who desires to remain anonymous. The amount paid was 9600 francs, in addition to which M. Gauthier-Villars deducted 734 francs from the account as the contribution of the printer towards this valuable work.

MR. F. J. BENNETT, who joined the Geological Survey of England in 1868, has just resigned his post on the staff. During his long service he has mapped large areas of the Cretaceous, Tertiary, and Drift deposits in the Eastern counties, and in Surrey, Berkshire, and Wiltshire. He retires to West Malling in Kent.

DR. M. E. WADSWORTH has protested against the introduction, by Dr. E. Hussak and Mr. G. T. Prior, of the name "Zirkelite" for a new mineral, on the ground that he (Dr. Wadsworth) had previously used the name for a basaltic glassy lava, which often forms the entire mass of thin dykes, and the exterior parts of larger dykes of diabase and melaphyr.

MR. A. A. JULIEN has discussed (*Journal* of the Franklin Institute, April 1899) the elements of strength in the constitution and structure of building-stones. He remarks that blocks of hewn stone are always seamed and weakened by minute cracks. Rude processes of quarrying, the use of heavy hammers, and blasting, are apt to act injuriously on stone, and to cause an inferiority in hewn as compared with sawn cubes. He draws attention to the minute structure of various rocks; and, after all, concludes that the most satisfactory of all tests, when available, under known conditions and of sufficient antiquity, is the study of weathered surfaces of ancient stone-buildings and monuments.

THE gold-bearing slates of Nova Scotia have been investigated by Mr. J. Edmund Woodman (*Proc. Boston Soc. Nat. Hist.*, vol. xxviii., March 1899). The rocks extend along the eastern side of the country in a belt which averages twenty-five miles in width, and covers an area of about six thousand square miles. They are highly metamorphosed, and are regarded as probably belonging to the Algonkian system. The rocks are intersected by veins of quartz and calcite containing gold, both free and in the various sulphides, which are abundant. Among the veins much interest attaches to the gold-bearing stratified veins, often called "leads"; and it is observed that, although the veins lie parallel to the planes of stratification, they must have come from below, and have been formed from hot waters which bore various substances in solution. Probably in this complicated region the gold is of varied origin. In some cases it must have been deposited with the sediments, and has since been concentrated by subaërial agencies.

IT is many years since the question of the chemical reactions which occur in the pan amalgamation of silver ores has been raised. Since Hague's experiments his conclusions have been accepted that cuprous chloride is formed by the interaction of common salt, bluestone and metallic iron, and that cuprous chloride is instrumental in reducing sulphide of silver. As the result of a series of experiments, however, Mr. H. F. Collins put forward a new account of the pan process at the last meeting of the Institution of Mining and Metallurgy. According to his view, a "chloride" ore is readily treated in an iron pan without bluestone or metallic copper, the silver compounds being directly reduced by the iron. In the case of sulphide ores, treatment is facilitated by the addition of sulphate of copper, which is rapidly reduced to metallic copper by the iron. The copper, whether amalgamated or not, acts on sulphide of silver, reducing it to metal and enabling it to be taken up by the mercury. On the other hand, cuprous chloride, a still more energetic agent in reducing sulphide of silver, never exists in the pan, and in this way the comparatively bad results obtained in the treatment of sulphide ores in the presence of metallic iron are explained. The use of copper-bottomed vessels in the treatment of sulphide ores has been practised for over a century. In such vessels cuprous chloride is formed in considerable quantities.

THE cosmopolitan character of Cairo is exemplified by an announcement which we have received referring to the Ghizeh Zoological Garden. The information is printed in six languages, namely English, French, German, Italian, Greek, and Arabic. From it we learn that the garden is open every day, Sundays included, that the collection of animals is such as pleases the popular mind, and includes two lionesses formerly belonging to the Khalifa at Omdurman, and that a large variety of plants may be seen. The paths extend altogether to a length of six miles (of which three and a half miles are paved with coloured mosaic), the grottos were erected in the time of Ismail Pasha, and more than twenty bridges cross the ornamental water in the grounds. The garden is evidently a very pleasant and instructive place.

MR. A. HALL, of Highbury, has designed an almanac with the object of eliminating the inconvenience consequent on the various days of the months falling on different week days, owing to the changing number of days in each month. His scheme is to make New Year's Day separate from the rest, calling it January 0, and then divide the remaining 364 days into thirteen months of twenty-eight days each. Following this plan, therefore, any particular day of any month will always fall on the same day of the week, and this would, of course, be convenient for many purposes. The extra month he proposes to denote by the name "Christember." The almanac sent us is printed on this principle, and a useful item included is the table of corresponding dates between the Gregorian, Julian, Jewish and Mohammedan calendars.

A SYSTEM of printing telegraphy, known as "Prof. Rowland's Multiplex," is stated by *Engineering* to have been recently tested between Philadelphia and Jersey City with highly satisfactory results. On this system a message is sent and received in legible and easily read type, transmitted from keyboards similar to those of a typewriter, the characters including simply the ordinary alphabet and numerals. The device on trial was made at the Johns Hopkins University in order to demonstrate what merits it possessed and also its weakness, if any, and it is arranged for eight messages, four in each direction, and duplexed in the usual way. The messages are printed on either a tape or a page, and a speed of sixty words a minute has been obtained in some of the experiments, but the limit of speed or the number of messages was not reached. There is no other multiplex printing system sending from a keyboard and received on a page, and this one is only a part of that invented by Prof. Rowland. It is stated that the whole invention contemplates a relay method, by which any amount of territory may be covered, and comprises a system by which eight people in one city can be in communication with eight others in another place over one wire and with absolute secrecy. Among the advantages claimed for the multiplex system is that of less liability of error, since there is only one person engaged, and he the sender; while, by the Morse system, there is an opportunity for mistakes at each end of the line.

THE Director of the Batavia Observatory, Dr. Van der Stok, has published the monthly and yearly rainfall values of the East Indian Archipelago for 1897—the nineteenth year of the series. The stations number 215; in Java the rainfall of the year was less than the average, but in Sumatra the amount was greater than the mean, especially during the first part of the year. One of the tables shows the greatest quantity of rain in twenty-four hours during each month, for the years 1879–97; at Batavia and several other places the fall amounted to over 11 inches, and in the south of the island of Saparoea to nearly 16 inches.

PROF. L. ERRERA, of Brussels, reprints from the *Bulletin* of the Royal Academy of Belgium an account of experiments made on *Aspergillus niger*, which he claims to prove indisputably that an acquired character—viz. adaptation to the medium in which it grows—is transmitted by inheritance.

THE part of the *Minnesota Botanical Studies* for February is full of interesting matter. Besides papers of more local interest, are articles on seedlings of certain woody plants, and on the comparative anatomy of hypocotyl and epicotyl in woody plants, by Mr. F. Ramaley; a contribution to the life-history of *Rumex*, by Mr. Bruce Fink; one on seed dissemination and distribution of *Razoumofskia robusta*, a parasitic plant belonging to the Loranthaceæ, by Prof. D. T. MacDougal; also observations on *Gigartina*, by Mary E. Olson, and on *Constantinea*, by Mr. E. M. Freeman.

PROF. F. PLATEAU, of Ghent, pursues his adverse criticism of the theory that insects are mainly attracted to flowers by the sense of sight in their capacity as pollen-distributors. In a paper, reprinted from the Memoirs of the Zoological Society of France, he details a series of observations on *Salvia horminum* and *Hydrangea opuloides*. Neither the coloured bracts of the former, nor the conspicuous sterile flowers in the latter species, can be regarded as "vexillary." In both cases the pollinating insects make their way at once to the flowers which contain the honey, without being visibly guided by the showy organs in either case; while, if these are removed, it does not appear to make any material difference in the number of insects which visit the inflorescence.

The conception of vast magnitudes forms the basis of two papers in *Die Natur* for April, by H. Sonnenschmidt, entitled "A Glance at the Kingdom of Large Numbers."

"Mosquitos and Malaria" form the basis of an article by Dr. F. Mesnil, in the *Revue générale des Sciences*, on the hæmatozoa of marsh fevers. The paper is illustrated by figures showing the different stages of the hæmatozoa both of man and of birds.

In two papers communicated to the *Verhandlungen* of the German Physical Society, C. Liebenow applies the principles of thermodynamics to calculate the thermo-electromotive force of metal conductors, and compares the results of theory and experiment.

The Horseless Age, a New York journal devoted to the interest of the motor vehicle industry, is now, at the beginning of its fourth year, issued weekly instead of monthly. The first number of the new volume contains a paper by Mr. Hudson Maxim, on "Some thermodynamics of vehicle motors," and an editorial discussion on the question "Shall vehicle motormen be licensed?"

An extension of the methods of integration of Monge and Ampère is worked out by G. Vivanti in the *Rendiconti del R. Istituto Lombardo*, xxxii. 6. The present paper contains a generalisation for any number of variables of certain investigations of the types of partial differential equations of the second order which satisfy conditions of integrability, the corresponding system of conditions in the case of three variables having been investigated previously by Vivanti, whose results have been generalised by Forsyth.

In a communication to the *Bulletin* of the Cracow Academy, No. 2, M. K. Zorawski applies the method of conformal representation to the convergency of Lagrange's, Bürmann's, Hoene-Wronski's, and other series derivable from Taylor's theorem. The same writer also discusses the geometry of certain infinitesimal transformations and differential expressions which do not possess the property of remaining invariable under the given transformations. This number of the *Bulletin* also contains papers by S. Kepinski on the integrals of solutions of certain equations of the second order with three singular points.

In *Terrestrial Magnetism* for March 1899, Dr. L. A. Bauer gives two papers, one on the physical decomposition of the earth's permanent magnetic field, and the other a preliminary note on the question, "Is the principal source of the secular variation of the earth's magnetism within or without the earth's crust?" The object of the first paper is to resolve the earth's so-called permanent field into component ones physically interpretable. In it the author arrives at the somewhat striking conclusion that the unsymmetrical distribution of the earth's magnetism, and the unsymmetrical distribution of temperature as exhibited on the earth's surface, on the average for the year, are in some way related to each other.

Prof. H. Poincaré, writing in the *Revue générale des Sciences*, deals with certain considerations connected with the theory of probability. The author, from consideration of various problems, points out that in all probability calculations it is necessary to take as starting-point some hypothesis or convention which is always to a certain degree arbitrary. The most frequent hypothesis is the doctrine of continuity, and the most satisfactory calculations are those in which the result is independent of the hypothesis made at the commencement, provided that this hypothesis satisfies the conditions of continuity.

Dr. H. J. Oosting, writing in the *Zeitschrift für den physikalischen und chemischen Unterricht*, describes several contrivances for exhibiting the resultant of two circular or elliptic vibrations of different periods. In these a beam of light is reflected in succession from two mirrors, which are made to rotate about axes nearly but not quite perpendicular to their planes, the two rotating systems being connected by cogged wheels or an endless band, by which the ratio of the periods of rotation is defined, and the path of the resultant motion is shown by allowing the doubly-reflected beam to fall on a screen. The curves produced by composition of *two* circular or elliptic motions could be drawn by a much simpler apparatus, consisting essentially of a jointed pendulum capable of vibrating in all directions; but we would suggest that Dr. Oosting's method might be applied to tracing the various forms obtained by compounding *three* or more circular motions whose periods are in the ratio of different whole numbers.

Slowly but surely the photographic film is taking the place of the glass plate for many purposes, and its introduction now into the physical and astronomical laboratory is an important indication of its progress. Being light and flexible, and as sensitive and durable as glass plates, the two first-named properties render it of great service where weight and curved fields have to be dealt with. To determine the value of films where it is difficult to use the ordinary glass plate, Sir Norman Lockyer has lately been experimenting, and very successfully, with them, with the idea of adapting them to spectroscopic photography. The large concave Rowland grating now in use for solar spectroscopic photographs, has 20,000 lines to the inch ruled on its surface, and is of 21½ feet radius, giving a spectrum of 30 inches long. The focal plane of this grating is of necessity considerably curved; in fact, the plane of accurate definition at the edges of the field is about 0·5 inch in front of the similar plane at the centre. It is, therefore, impossible to get a sharp photograph of the whole spectrum on a glass plate; in fact, not more than 18 to 20 inches of the spectrum can be brought into focus on the same plane. This difficulty is, of course, got over by the use of a flexible film, which can be bent to the curvature of the field. The Kodak Company have sent us a print of one of Sir Norman's photographs taken with this Rowland concave grating. It is 30 inches long, and shows the arc spectrum of iron with a comparison spectrum of the sun from wave-length 3600 to 5200, and the lines are beautifully sharp from one end to the other. Sir Norman Lockyer also hopes that by using films, instead of glass plates, at the next solar eclipse, he will be able to obtain a greatly increased number of photographs, owing to the rapidity with which the film can be shifted in the short space of time available for photographic operations. At the last eclipse the photographic work was concentrated on obtaining a series of photographs of the chromosphere, both about the time of beginning and end of totality. By careful drill Mr. Fowler and Dr. W. J. S. Lockyer were both able to secure ten photographs at each of these important periods, the time occupied in making each series of ten exposures being twelve seconds. An apparatus for carrying films is also being designed, which can be adapted to the spectroscopic cameras at present in use in the laboratory and observatory.

At the recent meeting of the Institution of Mining Engineers, the use of high-pressure steam as a possible substitute for gunpowder or other dangerous explosives in coal mining was suggested by Major-General H. Schaw, C.B. Broadly, the suggestion is that a cartridge of pure water lodged in a shot-hole should be converted into steam at about 150 pounds per square inch pressure by means of electricity of low tension; the cartridge or boïler to be made of such strength that it would burst at about this pressure, when the force set at liberty would break down the coal. As an approximation, Major-General Schaw points out that a water-cartridge 1¾ inches in diameter and 3½ inches long, to be used in a 2-inch blast-hole, would hold about 8·4 cubic inches of water. It would be converted into high-pressure steam, and burst the cartridge in about one minute with the electrical power which the author suggests, and would thus exert a sudden force of about 1⅓ tons. The calculations which the author has made on the subject, and a sketch of a form of cartridge which embodies the principles of the suggestion, accompany the paper.

A LEAFLET, prepared and issued by Mr. John Plummer, Sydney, New South Wales, brings together a number of interesting facts referring to Australian birds. Although Australia has no native song birds like the nightingale, lark, thrush, or linnet, it possesses a great variety of feathered species, several of great beauty, and many possessing features of interest. Many birds known in Europe are plentiful in New South Wales. Among these are eagles, hawks, owls, swifts, swallows, martins, fly-catchers, pelicans, sand-pipers, plovers, ducks, grebes, petrels, gulls, terns, penguins, and albatrosses. The number of ducks on the inland rivers and lagoons is at times surprising. The Rev. J. E. Tenison Woods says he has travelled in winter along the river Murray, and the long estuary of the Coorong, and for upwards of 120 miles was never out of sight of large flocks, which literally darkened the air and water. The sparrow, as in other countries, is the pest of the farm and orchard in New South Wales. So long as there is plenty of seed and fruit the bird does not trouble itself about insects, but leaves it to its insectivorous brethren. Every kind of British cage-bird thrives in the colony, but when liberated they often have to fight for existence with the native species.

MESSRS. SWAN SONNENSCHEIN AND CO. announce the forthcoming publication of "Curiosities of Light and Sight," by Mr. Shelford Bidwell, F.R.S.

DURING May the following lectures will be given on Tuesday evenings at the Royal Victoria Hall, Waterloo Road, S.E.:—May 2, Mr. E. S. Prior, "The Art and Practice of Garden-making"; May 9, Mr. R. Kerr, "Picturesque Ireland"; May 16, Prof. Beare, "Curiosities of Insect Life."

SOME members of the Avicultural Society are organising a Postal Club for the encouragement of bird and animal photography. The co-operation of photographer-naturalists is invited. Address Mr. Chas. Louis Hett, hon. secretary *pro tem.*, Springfield, Brigg.

MESSRS. DUCKWORTH AND CO. are about to publish a book on natural selection, by Mr. Frederick Wollaston Hutton, F.R.S., entitled "Darwinism and Lamarckism." The object of the work is to give a concise account of the origin and growth of the Darwinian doctrine, including its most recent developments.

THE inspiring "Hunterian Oration" recently delivered at the Royal College of Surgeons of England, by Sir William MacCormac, Bart., K.C.V.O., has been published in volume form by Messrs. Smith, Elder, and Co. An abstract of the address has already appeared in these columns (p. 402); but every student of medical science should read the address in full, in order to understand the influence of Hunter's work upon modern surgery.

MESSRS. R. AND R. BECK, LTD., have issued a new catalogue of the Frena hand camera, and will send a copy to any one on application. The good qualities of the Frena are known to many photographers, and the selection of pictures in the catalogue shows that fine results can be obtained with this form of camera.

AN illustrated international monthly magazine of photography, published in four languages, and entitled *Camera Obscura*, will make its appearance in June. The magazine will be under the chief editorship of J. R. A. Schouten, the assistant editors being: French Section, Maurice Bucquet; German Section, R. Ed. Liesegang; English Section, Max Sterling; Dutch Section, Chr. J. Schuver. The publishers will be Messrs. Binger Bros., Amsterdam; and the publishers for Great Britain and the Colonies, Messrs. Williams and Norgate.

AMONG the new features of the 1899 edition of "The Statesman's Year-Book" (Macmillan), edited by Dr. J. Scott Keltie, with the assistance of Mr. I. P. A. Renwick, are a map of Africa showing railways, navigable waters, and distances from coast, and one showing telegraphs and political divisions; a map of Newfoundland, illustrating the French shore question; and a map showing the addition on the Chinese mainland to the colony of Hong Kong. There are also preliminary tables showing the revenue, expenditure, debt, and debt-charge of the principal countries of the world, with the commerce of these countries in figures and per head of population; and a table showing the gold and silver production of the world. The events of the past year have necessitated a number of alterations, and the additions have increased the volume from 1166 to 1248 pages. No one interested in political geography can dispense with this annual statement of the position of the countries of the world.

MM. GEORGES CARRÉ AND C. NAUD, Paris, have commenced the publication, under the general title "Scientia," of a handy collection of monographs, by distinguished investigators, on important scientific questions. The collection is divided into two series, one containing papers on physical science, and published under the direction of MM. Appell, Cornu, d'Arsonval, Friedel, Lippmann, Moissan, Poincaré, and Potier; and another series containing biological papers edited by MM. Balbiani, d'Arsonval, Filhol, Fouqué, Gaudry, Guignard, Marey, and Milne-Edwards. In the first volume of the physical series, M. Poincaré gives a simple account of Maxwell's theory and Hertzian oscillations. In the first volume of the biological series, Prof. Bard deals with "La spécificité cellulaire," referring particularly to the consequences of this doctrine in biology. The second volume in this series, by Dr. F. le Dantec, is on sexuality. Only these three volumes have so far appeared, but a number of others are in preparation, and will shortly be published. Each volume will be complete in itself, and the complete set of monographs will make a convenient library of modern scientific work and opinion.

THE additions to the Zoological Society's Gardens during the past week include two Himalayan Monauls (*Lophophorus impeyanus*, 2 ♂) from the Himalaya Mountains, presented by Mrs. Barnewell Elliot; a Black-shouldered Kite (*Elanus caeruleus*) from Ceylon, presented by Mr. J. D. Waley; a Macaque Monkey (*Macacus cynomolgus*, var.) from India, a Brazilian Tapir (*Tapirus americanus*, ♂) from Peru, a Great Bustard (*Otis tarda*), European; three Anoas (*Anoa depressicornis*, ♂ ♂ ♀) from the Celebes, deposited; two Brush Turkeys (*Talegalla lathami*), three Pectoral Quails (*Coturnix pectoralis*), a Varied Hemipode (*Turnix varia*) from Australia, two green Glossy Starlings (*Lamprocolius chalybeus*) from North-east Africa, two White-backed Trumpeters (*Psophia leucoptera*) from the Upper Amazons, purchased; five Barbary White Sheep (*Ovis tragelaphus*, 2 ♂, 3 ♀), a Yellow-whiskered Lemur (*Lemur xanthomystax*), born in the Gardens.